We Claim:

Claim 1. An integrated optical mode shape transformer comprising:

(a) a first waveguide layer having a first refractive index value, a first thickness value, and an input end,

(b) a second waveguide layer having a second refractive index value and a second thickness value,

(c) said second layer having an input end, an output end, and a width that is laterally tapered down between said input end and said output end, and

(c) means for fabricating second waveguide layer contiguously on top of said first waveguide layer.

Claim 2. The transformer of claim 1 wherein said first refractive index value and said second refractive index value are substantially the same.

Claim 3. The transformer of claim 1 wherein

(a) said fabrication means comprises means of depositing a lower refractive index material over said first waveguide, means of planarizing back said lower refractive index material so as to expose the top surface of said first waveguide layer, and

(b) means of depositing said second waveguide layer.

Claim 4. The transformer of claim 3 wherein said means of depositing consists of one or more of chemical vapor deposition, sputtering, spin coating, epitaxial growth, ebeam deposition, or flame hydrolysis deposition.

Claim 5. The transformer of claim 3 wherein said means of planarizing consists of one or more of polishing, chemical mechanical polishing, or a multi-step dep-and-etch process.

Claim 6. The transformer of claim 1 further comprising:

(a) providing an input fiber having a predetermined spot size,

(b) said first waveguide layer having a width at said input end matching that of said fiber spot size, and

(c) said second waveguide layer having a width at said input end matching that of said fiber spot size.

Claim 7. The transformer of claim 6 wherein sum of said first thickness of said first waveguide layer and said second thickness of said second waveguide layer is substantially the same as said input fiber spot size.

Claim 8. A method of fabricating an integrated optical mode shape transformer comprising the steps of:

(a) means for depositing a first waveguide layer on a substrate, said first waveguide layer having a first refractive index value, a first thickness value, and an input end,

(b) means for fabricating a second waveguide layer contiguously on top of said first waveguide layer, said second layer having a second refractive index value, a second thickness value, an input end, and an output end,

(c) said second layer having a width that is laterally tapered down between said input end and said output end.

Claim 9. The transformer of claim 8 wherein said first refractive index value and said second refractive index value are substantially the same.

Claim 10. The transformer of claim 8 wherein said means of depositing includes one or more of chemical vapor deposition, sputtering, spin coating, epitaxial growth, ebeam deposition, or flame hydrolysis deposition.

Claim 11. The transformer of claim 10 wherein

(a) said means for fabricating second waveguide consists of the steps of depositing a lower refractive index material over said first waveguide, and means of planarizing back said lower refractive index material so as to expose the top surface of said first waveguide layer, and

(b) depositing said second waveguide layer contiguously on top of said first waveguide layer.

Claim 12. The transformer of claim 11 wherein said means of planarizing consists of one or more of polishing, chemical mechanical polishing, or a multi-step dep-and-etch process.

Claim 13. The transformer of claim 8 further comprising the steps of:

(d) providing an input fiber having a predetermined spot size,

(e) said first waveguide layer having a width at said input end matching that of said fiber spot size, and

(f) means of fabricating said second waveguide layer so as to have a width at said input end matching that of said fiber spot size.

Claim 14. The transformer of claim 13 further comprising the steps of depositing said first waveguide layer and said second waveguide layer such that the sum of said first thickness of and said second thickness is substantially the same as said input fiber spot size.